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TP 9840E

A Human Factors Evaluation of the Transcribed Weather Broadcast System

Prepared for

Transportation Development Centre

Policy and Coordination Group

Transport Canada

by

Ergo Systems Canada Inc.

APRIL 1989

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16. Abstract

This report is a human factors evaluation of the Vancouver-based prototype Automated Pilot Weather Information System (PWIS) developed by Oracle Communications Inc.

Thirty-one pilots were interviewed in person or by telephone using a standard questionnaire. In addition to interviews, approximately 20 conversations between flight personnel and pilots were taped in order to determine what type of questions pilots ask the operators. Six Vancouver flight service (FS) operators were interviewed on an individual basis to sollicit their reaction to the prototype PWIS.

Numerous favourable comments on the potential of an automated PWIS were noted, including the possibility of quick and easy access to aviation weather information by pilots, and reducing the workload on FS operators by eliminating their 15-minute manual update every hour.

However, in order to ensure maximum usability of the system, the various pilot and FS operator requirements which are detailed in the report must be addressed.

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16. Résumé

Le présent rapport concerne l'évaluation sur le plan ergonomique du système automatisé de renseignements météorologiques à l'usage des pilotes, PWIS, réalisé en prototype par Oracle Communications Inc. et utilisé à Vancouver.

Trente-et-un pilotes ont été interviewés à cet égard, soit directement, soit par téléphone, à partir d'un questionnaire normalisé. Une vingtaine de conversations entre des pilotes et des stations d'information de vol ont aussi été enregistrées pour déterminer le genre de questions que les pilotes ont l'habitude de poser. Enfin, six membres d'une station d'information de vol à Vancouver ont été interviewés afin de connaître leur opinion sur le PWIS.

Le potentiel du PWIS a fait l'objet de nombreux commentaires favorables, notamment la possibilité d'un accès rapide et facile par les pilotes à l'information météo aéronautique et, pour ce qui est du personnel au sol, celle de voir sa charge de travail réduite en n'ayant plus à effectuer la réédition horaire de l'information météo, tâche qui demande chaque fois une quinzaine de minutes.

Cependant, ce ne sera qu'une fois que toutes les faiblesses énumérées dans le rapport auront été éliminées qu'un système comme le PWIS pourra être utilisé à son maximum par les pilotes et le personnel au sol.

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SUMMARY

Ergo Systems Canada Inc., contracted with the Transportation Development Centre of Transport Canada to evaluate the prototye Automated Pilot Weather Information System (PWIS) developed by Oracle Communications Inc. (Oracle). This report is an evaluation of the prototype PWIS with recommendations concerning possible system modifications.

To evaluate the prototype PWIS, two primary groups were involved: pilots and flight service (FS) personnel. Due to limitations in finding subjects who had listened to the prototype PWIS and who would participate in the study, only thirty-one pilots were interviewed in person, or by telephone, using a standardized questionnaire. In addition to the interviews, approximately 20 conversations between flight service personnel and pilots were taped in order to determine what type of questions pilots ask the operators. Six Vancouver FS operators were interviewed on an individual basis to solicit their reactions to the prototype PWIS.

Of the thirty-one pilots, eight pilots had never listened to the prototype PWIS (non-listeners), while twenty-three had listened to the prototype PWIS at some time (listeners). Of the twenty-three listeners, seventeen had listened to the prototype PWIS (occasional listeners) sometime in the past, and six had listened to the prototype PWIS (immediate listeners) just prior to the interview.

In response to the question as to why they did not use the prototype PWIS, five of the eight non-listeners said that they did not know that the prototype existed at the time of the interview. Occasional listeners did not listen more often because the available weather information was not applicable to their routing, and over 50% said the system provided too much information. Pilots expressed frustration that they could not be more selective about the information they received. The major complaint expressed by recent listeners was that the prototype in its present format was too cumbersome.

Generally, the FS operators felt that the prototype PWIS did somewhat reduce their workload, and would substantially relieve some of their work pressures once it was error free, could perform autoverfication and send messages on-line. Oracle, in their report, detailed many of the limitations of the existing system which could be appropriately addressed in a production model.

Numerous favourable comments on the potential of an automated PWIS were noted including the possibility of quick and easy access to aviation weather information by pilots, and a reduction of the workload of FS operators by eliminating their 15 minute manual update every hour.

However, in order to ensure maximum usability of the system, the various pilot and FS operator requirements should be addressed.

Problems expressed by pilots included: the information was not necessarily updated every hour and at times was delayed; essential stations were missing (e.g. Squamish and Pemberton, amongst others); the system was not accessible on a toll free number; NOTAMS, in addition to other local low level information of interest to pilots, were not on-line yet. Furthermore, pilots felt that access to the information was too limited with the present menu structure and required listening to irrelevant stations. Hence, it is critical that the production model permit pilots to be more selective by expanding the features of the existing system such as adding branching

options to select specific stations (but this can also make the system cumbersome), or by including a fast advance button so that pilots can skip a station recording if it is not relevant to their flight plan. Alternatively, it may be viable to consider developing an expert system for this situation. At times pilots may not be familiar with the system or know what stations are relevant to their flight plan. Instead of selecting stations by menu number, it may be possible to enter the abbreviations of the departure and the destination terminal/stations, since a telephone key pad also has the necessary letters, and the let the computer present the weather information for the stations along the flight path. On a number of occasions pilots also expressed an interest in obtaining a hardcopy of the information. With the increasing proliferation of fax machines, it may be possible to build into the system a method whereby pilots can identify where they would like a fax copy sent.

Another major frustration noted by the FS operators was the delay in transcribing the relayed messages onto the computer. Due to problems with time stamping messages, new messages currently can not go on-line without disturbing existing messages until approximately 20 minutes after the hour with the result that pilots call FS operators unnecessarily for update. This needs to be resolved.

Additional consideration must be given to the following three questions:

1. At the present time auto verify is not yet in use. What reliability is required to make the auto verify mode a viable one?

2. Is it possible in the second generation software for the system to find logical errors in messages?

3. What kind of training packages (sample message edits, etc.) would be required for new users?

If technological and procedural issues in this report are addressed then auto PWIS should be readily accepted by pilots and effectively reduce the workload of FS personnel.

SOMMAIRE

Ergo Systems Canada Inc. a obtenu du Centre de développement des transports, Transports Canada, un contrat concernant l'évaluation du système automatisé de renseignements météorologiques à l'usage des pilotes (PWIS) réalisé en prototype par Oracle Communications Inc., appelé simplement Oracle. Le présent rapport rend compte de cette évaluation et formule des recommandations sur les modifications à apporter au système.

Pour les besoins de cette évaluation, deux groupes de sujets ont été impliqués: des pilotes et des membres du personnel d'information de vol. Étant donné la difficulté de trouver des sujets ayant effectivement utilisé le PWIS et qui voulaient bien participer à l'étude, trente-et un pilotes seulement ont été interviewés, soit directement, soit par téléphone, à partir d'un questionnare normalisé. Outre ces interviews, une vingtaine de conversations entre des pilotes et des stations d'information de vol ont été enregistrées pour déterminer le genre de questions que les pilotes ont l'habitude de poser. Enfin, six membres d'une station d'information de vol à Vancouver ont été interviewés afin de connaître leur opinion sur le PWIS.

De 31 pilotes approchés, huit ont déclaré n'avoir jamais utilisé le PWIS (non utilisateurs), tandis que 23 ont dit en avoir fait l'usage à un moment donné (utilisateurs). De ces derniers, dix-sept avaient utilisé le prototype (utilisateurs occasionnels) dans le passé, et six (utilisateurs récents) peu de temps avant d'être interviewés.

À la question demandant pourquoi ils ne se sont pas servi du PWIS, cinq des huit non utilisateurs ont répondu qu'ils ignoraient l'existence du système en question. Les utilisateurs occasionnels ont dit ne pas utiliser le PWIS plus souvent parce que l'information météo fournie ne concerne pas la liaison qu'ils desservent, et plus de 50 p. 100 ont trouvé l'information disponible trop abondante. Les pilotes ont déclaré ressentir de l'irritation du fait qu'ils n'avaient pas la possibilité de s'en tenir à l'information les intéressant. Quant aux utilisateurs récents, leur principale objection se situait au niveau du format; le système était trop encombrant dans sa forme actuelle.

De façon générale, le personnel au sol estime que le PWIS a réduit sa charge de travail dans une certainte mesure et le système pourrait la réduire davantage, à condition qu'il soit exempt d'erreurs, qu'il fasse de l'auto-contrôle et qu'il formalise lui-même les messages à mettre en circuit. (Dans son rapport, Oracle entreprend d'énumérer les faiblesses qui, dans un modèle de production série de leur système, auront été éliminées).

Le potentiel du PWIS a fait l'objet de nombreux commentaires favorables, notamment la possibilité d'un accès rapide et facile par les pilotes à l'information météo aéronautique et, pour ce qui est du personnel au sol, celle de voir sa charge de travail réduite en n'ayant plus à effectuer la réédition horaire de l'information météo, tâche qui demande une quinzaine de minutes.

Toutefois, en vue d'inciter les pilotes et le personnel d'information de vol à utiliser le système à son maximum, il est auparavant indispensable que les exigences qu'ils formulent à son égard aient été satisfaites.

Les pilotes ont relevé les problèmes suivants: l'information n'était pas toujours mise à jour aux heures et parfois même son émission était retardée; il manquait certaines station parmi les plus importantes (celles de Squamish et de Pemberton entre autres); le système n'était pas accessible via une liaison sans péage; les NOTAM et d'autres informations secondaires intéressant les pilotes n'étaient pas disponsibles en direct et, enfin, les menus tels qu'il sont organisés limitent l'exploitation du système, astreignant à des écoutes inutiles. Il est donc indispensable que le modèle série permette aux pilotes d'être plus sélectifs, par l'ajout, soit de fonctions de branchement permettant de se brancher directement sur la ou les stations voulues (au risque de rendre le système encore plus encombrant), soit d'un bouton d'avance rapide laissant l'usager sauter par-dessus les station que ne l'intéressant pas. Il est possible également d'envisager le developpement d'un système expert. Parfois, il arrive qu'un pilote ne sache pas exploiter le systéme ou qu'il ignore les stations reliées à son plan de vol. Dans ce cas, il est suggéré que, au lieu de menus, il soit possible d'interroger le système en y introduisant les indicatifs des stations de départ et d'arrivée ce qui est d'autant plus facile que le clavier téléphonique comporte également des lettres, et qu'il soit laissé à l'ordinateur le soin de sélectionner les stations longeant la route choisie et de présenter l'information météo correspondante. En de nombreuses occasions, certains pilotes ont voulu obtenir une sortie sur imprimante de l'information. Aves l'essor des télécopieuses, il pourra être possible de faire en sorte que les pilotes puissent obtenir du système qu'il expédie un télécopie à une destination donnée.

Une des grandes difficultés notée par le personnel d'information de vol a été celle de transcrire dans les délais l'information météo en vue de son introduction à l'intérieur du système. En raison de la nécessité de fixer une heure précise à tout bulletin avant qu'il ne quisse être relayé, il n'est actuellement possible d'intercaler, sans déranger le cours normal des opérations, un nouveau bulletin que quelque vingt minutes après le réédition horaire, rendant inutile tout appel de la part des pilotes avant ce temps-là. C'est donc là une autre faiblesse qu'il faudra corriger.

Il y a par ailleurs trois autres questions en suspens:

1. Présentement, l'auto-contrôle ne se fait pas. Mais, pour qu'il soit efficace, quel degré de fiabilité doit-on viser?

2. Avec la deuxième famille de logiciels, sera-t-il possible de doter le système d'une fonction lui permettant de détecter les erreurs de logique dans la transmission des bulletins?

3. Quels services de formation (génération de messages d'essais, etc.) faut-il prévoir à l'intention des nouveaux usagers?

Ce ne sera qu'une fois que toutes les faiblesses enumérées dans le présent rapport auront été éliminées qu'un système comme le PWIS pourra être accueilli sans réserve par les pilotes et qu'il réduira réellement la charge de travail du personnel des stations d'information de vol.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Background 1

1.2 Approach to the Evaluation of the Prototype PWIS 1

2.0 EVALUATION 2

3.0 RESULTS 3

3.1 Pilot Questionnaires 3

3.2 Questions Pilots Ask Flight Service Operators 9

3.3 Flight Service Operator Interviews 9

4.0 DISCUSSION 10

4.1 Pilot Requirements 10

4.2 FS Operator Requirements 11

5.0 CONCLUSIONS AND RECOMMENDATIONS 13

APPENDIX A - Pilot Interview Questionnaire

APPENDIX B - Transport Canada Aviation Weather Study 1988 for BC/Southwestern Alberta

TABLES

Table 1: Pilot Groupings..... 4

Table 2: Type of Operating License..... 4

Table 3: Number of Years Owning a License..... 5

Table 4: Total Houts Flown..... 5

Table 5: Type of Flying..... 5

Table 6: Flight Operation Type..... 6

Table 7: Percentages of Time Five Other Pre-Flight Weather Information Modes are Acceessed in Addition to FSS (Presented for each subject interviewed)

Table 7a Non Listeners..... 6
Table 7b Occasional Listeners..... 7
Table 7c Immediate Listeners..... 7

Table 8: Reasons Why Occasional Listeners had not listened to the Prototype PWIS at the Time of the Interview..... 8

Table 9: Rating of Prototype PWIS by immediate Listeners 8

Table 10: Prioritization of Desirable Modifications Proposed by Immediate Listeners..... 8

1.0 INTRODUCTION

Ergo Systems Canada Inc., an ergonomics consulting company specializing in human factors evaluation, research and training, contracted with the Transportation Development Centre (TDC) of Transport Canada to evaluate the prototype Automated Pilot Weather Information System (PWIS) developed by Oracle Communications Inc. ("Oracle").

This report describes the evaluation of the prototype PWIS with recommendations concerning possible system modifications.

1.1. Background

The Atmospheric Environment Service (AES) is responsible for providing the meteorological service for aviation across Canada. AES generally prepares hourly meteorological reports and forecasts which are then transmitted to Flight Service Stations (FSS) across the country by telex. At the present time Flight Services (FS) personnel take the printed copies of the teletype reports from the MIDS terminal, manually translate them into standard Air Traffic Services (ATS) work formats, where necessary, and then manually record the reports onto an ASSMAN MET-100 recording and telephone playback unit. This unit is a 10 track, audio deck which can handle four incoming telephone lines.

Air Traffic Services (ATS) has been considering replacing this rather labour intensive weather and aviator information system with more efficient, reliable and economical technology. Oracle specializes in concatenated digitized speech (computer assembled speech). Text-to-speech systems include tranlsation from an electronic data source (teletype). Oracle has recently developed a prototype PWIS which uses standardized electronic weather data, transmitted over teletype lines, and converts this directly into computer-assembled speech which is then available to pilots by telephone. Oracle also provided a recording capability that would permit ATS staff to record non-standardized messages directly into the system and to verify visually the transcription of incoming messages. It was expected that this system would be more efficient and contribute to improved safety and performance within the Air Traffic Services Flight Service station.

The prototype PWIS was installed at Vancouver International Airport in November 1987 for testing and evaluation until March 1989. The first phase of the testing was done off-line to determine if the system was technically sound. Since November 1988, the system has been on-line and testing has been initiated to evaluate user reaction to the system.

1.2 Approach To The Evaluation Of The Prototype PWIS

Many products produced today may be useful but often they are not usable. This problem has been recognized in the recent past and corrective action is being taken through the judicious application of ergonomics knowledge, also known as human factors.

In the last 10 years, the computer industry has broadened its market by developing products which are attractive to less dedicated users. Often today's computer systems are acted upon by two user groups: the consumer and the caretaker. The consumer, also referred to as the discretionary user, demands function and price, but they are also sensitive to usability. Typically consumers interact with computers to accomplish task results which can be

accomplished in other ways (bank teller, library search). If the usability of the computer terminal interface is not satisfactory, the task will be delegated, or done another way, or not done at all. The caretaker maintains and updates the information in the system and may be referred to as a dedicated user. Dedicated users will put up with a lot more frustration if the system does not possess user-friendly qualities. However, performance may be adversely affected and the quality of the information that is available may be questionable.

Many market forecasts have predicted further large increases in the production of mini- and micro-computers but this growth will not occur unless the machines are acceptable to both user groups. Good system design depends upon solving the dynamic, interacting needs of the four principal components of any system situation: user, task, tool and environment. For a system to be successful it must be appropriate, useful and usable. Usability depends upon the design of the tool in relation to specific user groups, the task and the environments. Usability for individual users, both consumers and caretakers, will be judged (a) by subjective assessment of ease of use and (b) by objective performance measures of effectiveness in using the tool.

Hence, in order to evaluate the prototype PWIS it has to be reviewed from the perspective of both the end user/consumer perspective,the pilot, and the FS operator who is the caretaker of the system.

2.0 EVALUATION

To evaluate the prototype PWIS, two primary groups were involved: pilots and flight services personnel.

Due to limitations in finding subjects who had listened to the prototype PWIS only thirty-one pilots were studied. These were pilots who had either called in into the Vancouver ATS office, during the months of January/February, to obtain weather information or walked into the office itself. Each pilot was interviewed either in person or by telephone using a standardized questionnaire (see Appendix A). To compare the results of this study with an earilier study conducted by Transport Canada (TC) in 1988 on 'Aviation Weather' some of the questions in the existing questionairre were generated from TC's 1988 questionairre.

In addition to the interviews, approximately 20 conversations between flight service personnel and pilots were taped in order to determine what type of questions pilots ask the operators. These conversations were used to determine whether or not the questions could have been directly answered by the PWIS system.

Six Vancouver flight service operators were interviewed on an individual basis to solicit their reactions to the prototype PWIS.

3.0 RESULTS

3.1 Pilot Questionnaires

Of the thirty-one pilots, eight pilots had never listened to the prototype PWIS (non-listeners), twenty-three had listened to the prototype PWIS at some time (listeners). Of the twenty-three listeners, seventeen had listened to the prototype PWIS (occasional listeners) sometime in the past, and six had listened to the prototype PWIS (immediate listeners) just prior to the interview (Table 1).

Non-listeners were interviewed to determine whether they differ in any way from listeners. Tables 2 - 7 describe the characteristics of the pilots, for both listeners and non-listeners, in terms of the type of license they have (Table 2), years of owning a license (Table 3), total hours flown (Table 4), the type of flying they do (Table 5), the type of operation they fly (Table 6) for and where they obtain their pre-flight weather information (Table 7a, b, c).

For both listeners and non-listeners most pilots had commercial licenses. Both groups had approximately 8 years flying experience and had flown over 350 hours during the past year. Over 50% of the listeners flew both IFR and VFR whereas the majority of non-listeners flew VFR only.

Most non-listeners used flight service operations 100% of the time to obtain pre-flight weather information in addition to personal observation (Table 7a). Some non-listeners also used a dispatch service, had access to a computer-based weather information system, or searched the television for information.

Those pilots who had listened to the prototype PWIS sometime in the past (Table 7b) continued to use the prototype PWIS occasionally (10 - 20% of the time). However, in almost 100% of the cases they would also call the flight services personnel. Frequently these pilots would also scan the television and use personal observation. Calling the weather office, dispatch, or accessing a computer were infrequently used sources.

Immediate listeners used the prototype PWIS approximately 50% of the time (Table 7c). However, they often also called into the flight service operator to verify the information. Most also used personal observation, some used the weather office, with fewer yet relying on dispatchers, television or a computer accessible system.

In response to the question as to why non-listeners did not use the prototype PWIS, five of the eight non-listeners said that they did not know that the prototype existed at the time of the interview. One non-listener (a U.S. pilot) reported that the system did not have the information he needed and the eighth non-listener preferred walking over to the flight service office instead of calling in.

Table 8 documents the responses of why occasional listeners did not listen more often. In some instances the available weather information was not applicable to their routing, and over 50% said the system provided too much information. Pilots expressed frustration that they could not be more selective about the information they received.

Table 1. Pilot Groupings

PILOT GROUP	NUMBER
Non-Listeners	8
Occassional Listeners	17
Immediate Listeners	6

Table 2. Type of Operating License

TYPE OF LICENSE	LISTENERS (n=23)		NON-LISTENERS (n=8)	
	Number	Percent of Total	Number of Total	Percent
Private	2	(9)	0	(0)
Commercial	10	(43)	6	(75)
Senior Commercial	5	(22)	0	(0)
ATPL	6	(26)	2	(25)
Navigator	0	(0)	0	(0)

Table 3. Number of Years Owning a License

	MEAN	SD
LISTENERS	8.0	5.8
NON-LISTENERS	7.8	8.2

Table 4. Total Hours Flown

	MEAN	SD
LISTENERS	462	285
NON-LISTENERS	359	239

Table 5. Type of Flying

	LISTENERS		NON-LISTENERS	
	Number	Percent	Number	Percent
VFR	8	(35)	5	(63)
BOTH/or IFR	15	(66)	3	(38)

Table 6. Flight Operation Type

	LISTENERS		NON-LISTENERS	
	Number	Percent	Number	Percent
AIRLINES/COMMUTER	13	(56)	2	(25)
PRIVATE	9	(39)	2	(25)
CHARTER	5	(22)	1	(12)
MILITARY	1	(4)	0	(0)
CORPORATE	4	(17)	3	(38)

Table 7. Percentages of Time Five Other Pre-flight Weather Information Modes are Accessed inAddition to FSS (Presented for each subject interviewed)

SUB	- Subject	COMP	- Computer
FSS	- FS Operator	R/TV	- Radio/Television
AUTO	- Prototype PWIS	PER	- Personal Observation
W.O	- Weather office	WOM	- Word of Mouth
DISP	- Dispatcher	UKN	- Unknown

7a) Non-Listeners (n=8)

	FSS	AUTO	W.O.	DISP	COMP	R/TV	PER	OTHER
1	45		10	45				
2					100			
3	100						100	
4	95			20	5	70	70	
5	100						10	
6	100						30	SOME
7	100						100	VFR
8	90		10			SOME	100	SOME

Table 7b. Occasional Listeners (n=17)

SUB	FSS	AUTO	W.O.	DISP	COMP	R/TV	PER	OTHER
1	100		1		1-2		SOME	
2	90	1	5			10	100	50
3	5	1	95				5	
4	90	2				5	50	
5	90				10		SOME	WOM
6	80	20		5		5	30	
7	50		10			100		
8	99					99	99	WOM
9	75	3		5-10		SOME	60	
10	100					10	51	
11	SOME		20	60	5		100	10
12	100	20		10	70	100		
13		100	SOME	SOME	SOME	SOME	SOME	
14	100				SOME	SOME	SOME	
15	99	1						1
16	70	30	70	60		10	100	
17	100	21		1	90	100		

7c. Immediate Listeners (n=6)

SUB	FSS	AUTO	W.O.	DISP	COMP	R/TV	PER	OTHER
1	SOME	80	10	80		50	100	
2	80	10	100		5			VFR
3	100	50	SOME			SOME	100	
4	100	5	60			15	100	
5	40	60						
6	55	<5					100	30

Table 8. Reasons Why Occasional Listeners (n=17) Had Not Listened to the Prototype PWIS at the Time of the Interview

COMMENT	NUMBER	PERCENT
Information was not applicable	4	(23)
System was cumbersome to use	5	(29)
No touch tone phone available	3	(18)
Can't ask questions	11	(65)
Provides too much information	11	(65)
Speed is too fast or too slow	0	(0)
Other reasons	7	(41)

Table 9. Rating of Prototype PWIS By Immediate Listeners (n=6)

		NUMBER	PERCENT
Speed of speech acceptable		6	(100)
Efficiency	a) acceptable	2	(33)
	b) cumbersome	4	(67)

Table 10. Prioritization of Desirable Modifications Proposed by Immediate Listeners (n=6)

	HIGH	MODERATE	LOW
User select sequence	4 (67)	2 (33)	0
Return to category of message	5 (83)	1 (17)	0
Return to message within category	4 (67)	2 (33)	0
Ability to connect with FS operator	1 (17)	3 (50)	2 (33)

Table 9 reports the responses of pilots who had just listened. Generally the rate of speech was considered acceptable, however, the system was reported as being cumbersome. In other words, like the occasional listeners, these pilots felt that the system provided more information than was relevant to their immediate needs.

Table 10 priorities some of the modifications pilots would like to see to the prototype PWIS, such as user select sequence, return to category of message and return to a message within a category. The ability to be connected directly to a flight service operator without redialing was not considered a priority.

3.2 Questions Pilots Ask Flight Service Operators

Approximately one-quarter of the calls only asked the FS operators whether or not there were any NOTAMS; half of the calls asked for weather information which was also available on the prototype PWIS; and the remaining twenty-five percent of the callers asked for weather information not available on the prototype PWIS (e.g. weather for Vancouver to Portland).

Some of the callers admitted to having listened to the prototype PWIS and wanting to see whether or not the information was accurate by calling the FS operator for verification. In a few instances the weather information had not been updated on the prototype PWIS which resulted in a phone call to the FS operator to ensure that there was no new information available.

3.3 Flight Service Operator Interviews

Generally, the Flight Service Operators felt that the prototype PWIS did somewhat reduce their workload and would substantially relieve some of their work pressure once it was error free, could perform autoverfication and send messages on-line. Oracle, in their report, detailed many of the limitations of the existing system which could be appropriately addressed in a production model.

4.0 DISCUSSION

Numerous favourable comments on the potential of an automated PWIS were noted including the possibility of quick and easy access to aviation weather information by pilots, a reduction of workload of FS operators by eliminating their 15 minute manual update every hour. Furthermore the prototype is not limited in track numbers as the old manual system is. The old system requires 14 tracks but only has 10 available. Resulting in Vancouver, Abbotsford and Victoria all being on the same track. If a special message or comment was required for one of the stations then all had to be recut on that track. All of these comments strongly favour the development of a full scale prototype PWIS which would then, after a period of testing, become the production model for ATS. However, in order to ensure maximum usability of the system, the various pilot and FS operator requirements should be addressed.

Since the requirements of the pilots and the FS operators are so different it will simplify the discussion if their needs are discussed separately.

4.1. The pilot (consumer) requirements

A substantial amount of difficulty was associated with finding subjects who had listened to the prototype PWIS. At the present time there is no way of knowing how many pilots access the prototype PWIS on a daily basis. Logging this information in the future may be useful in order to determine the number of subscribers who rely upon the system. (A logger could not be installed on the prototype unit due to capacity limitations, but would be built into production units).

Non-listeners (non-users) were interviewed to determine why they did not use the system. Non-listeners did not differ substantially from listeners in terms of flying experience, or the type of operations they fly in. The main reason that non-listeners did not use the prototype PWIS was because they did not know that it existed. Last August ATS placed a notice in its newsletter announcing the availability of the system. Numerous pilots missed that announcement and there were no other announcements made to notify pilots of its existence.

To ensure greater use of a production PWIS it is recommended that pilots are made aware of its existence by a prerecorded announcement when calling into flight operations. For example: " You have reached FS operations. If you are calling for current aviation weather reports or NOTAMS press 9, otherwise hold for the operator to take your call".

Initially, it may also be useful for the FS operators to log the type of calls they receive and why the pilot did not use the production PWIS. This information would assist the system developers in enhancing the system and to determine whether or not a publicity campaign needs to be initiated to increase pilot awareness and usage of the automated PWIS. ATS procedures would have to be altered to accomodate this feature.

Those pilots who did access the prototype PWIS did so for several reasons including: to get a general overview of the weather, to get an update, not wanting to bother the FS operator, or because they could not get through to the operator. However, a number of deficiencies were identified with the information content of the present system (many of which have been already identified and documented in the "Pilot Weather Information System" report prepared by Oracle for TDC). Problems expressed by pilots included: the information was not necessarily updated

every hour and at times was delayed; essential stations were missing (e.g. Squamish and Pemberton, amongst others); the system was not accessible on a toll free number; NOTAMS, in addition to other local low level information of interest to pilots, were not on-line yet. Furthermore, pilots felt that access to the information was too limited with the present menu structure and required listening to irrelevant stations. Pilots admitted that at the present time it was still faster to call the FS operator to obtain all necessary information.

Hence, it is critical that the systems and procedures be revised and that the production model permit pilots to be more selective in obtaining the necessary information in addition to providing the more general information often imparted by the FS operator. The latter half of the recommendation is in part achieved by placing SIGMETS at the beginning of the menu before the pilot can select a number thereby ensuring that they hear the message. The former part of the recommendation can be achieved in a number of ways: either by expanding the features of the existing system by adding branching options to select specific stations (but this can also make the system more cumbersome), or by including a fast advance button so that pilots can skip a station recording if it is not relevant to their flight plan. Alternatively, it may be viable to consider developing an expert system for this situation. At times pilots may not be familiar with the system or know what stations are relevant to their flight plan. Instead of selecting stations by menu number, it may be possible to enter the abbreviations of the departure and the destination terminal/stations, since a telephone key pad also has the necessary letters, and then let the computer present the weather information for the stations along the flight path. On a number of occasions pilots also expressed an interest in obtaining a hardcopy of the information. With the increasing proliferation of fax machines it may be possible to build into the system a method whereby the pilots can identify where they would like a fax copy sent.

The economical technical and administrative feasibility of these suggestions need to be carefully reviewed. However, based on the comments received to date a more flexible system needs to be developed which imparts much of the same general information as FS operators do. Due to the magnitude of Transpaort Canada's 1988 aviation weather study (3213 volutary responses) no attempt has been made in this report to integrate the results. However, data relevant to this study and specific to the Southern BC/Alberta region such as pilot questionnaire responces and converts on prefight access to weather and DUATS/PC are included in Appendix B. Many of the 1988 Canada findings in this study.

4.2 The FS operator (caretaker) requirements

In recent years, a number of researchers have begun to describe what the desirable qualities of a software program should be. These have been summarized as the following:

Adaptive	A system should be responsive to individual user differences in interaction manner, depth and style.
Transparent	A system must permit a user's attention to be focused entirely on the task or job being performed, without concern for the mechanics of the interface.
Comprehensible	A person should know what to look at, what to do, when to do it, why to do it, and how to do it.
Naturall	Dialogues should mimic user thought processes and vocabulary.
Predictable	System actions should be expected within the context of other actions that are performed.

Responsive	Every human request should be acknowledged, every system reaction clearly described.
Forgiving	A system should be tolerant of the human capacity to make errors.

The prototype PWIS meets some of these criteria. The following paragraphs elaborate on where the system could be improved.

Currently most errors with the system occurred during entry of the aviation weather data by AES personnel, such as the inclusion of extra spaces and extraneous letters (e.g. VIC IDE) which the digital converter could not decode. It is essential that AES develop more stringent data entry standards in addition to providing operator feedback in terms of errors. Some data entry errors are inversion errors, resulting in logic errors as the weather forecast is transcribed (e.g. CI - cirrus clouds vs. IC - ice crystals). These errors need to be addressed in a production model.

Correcting AES errors by FS operators at the present time is not easy. The prototype PWIS uses a word cursor instead of a space cursor creating the need to re-key the entire word. Hence, if there are a number of errors in a message it is faster for the operator to voice in the entire message than to manually re-key it. It is recommended that future systems have a space cursor.

Another major frustration noted by the FS operators was the delay in transcribing the relayed messages onto the computer. Due to problems with time stamping messages new messages presently can not go on-line without disturbing existing messages until approximately 20 minutes after the hour, resulting in pilots calling FS operators unnecessarily for an update. This artifact needs to be resolved. Furthermore if FS operator continue verifying the area forecast messages and sending them on-line then the messages should enter the system in a staggered fashion so that the FS operator is not overwhelmed by a backlog.

A brief review identified user (caretaker) specific software problems in the existing system:

(1) At the present time operators are able to disconnect the signal announcing that new messages have come in, possibly resulting in the messages going unattended for prolonged periods of time before being shunted on-line. To minimize the time of unattended messages it would be useful if an auditory signal were always used to notify the operator that a new message had come in which needed verification.

(2) Once a message has been sent on-line it is not possible for the operator to retrieve the message to do any further editing. If the message needs to be changed in any way the only thing the operator can do is to delete the entire message and to voice or key it in again. Even though this is a software artifact of this trial prototype only, editing information on this system is not efficient.

(3) To indicate the status of the system the header blinks if everything is fine, and appears solid if there is a problem. This blinking has been found to be distracting. Generally, if everything is fine the header should be solid and should only flash to draw to the attention of the operator the fact that something is wrong. Furthermore FS operators would like to see the screen blanked out when not in use to avoid

The FS operators felt it would be very useful if the prototype PWIS could handle remarks/specials. Specials are mostly generated during storms when the workload on the operators increases substantially.

The prototype's ablility to adapt to changes in format is limited. The production model will need deal with changing the format so that new information arrangements can be accommodated by the system as they are encountered.

To ensure voice consistency operators are encouraged to develop their own voice discs. However, pilots did not comment on being disturbed by having to listen to to different voices. Developing a voice disc takes approximately 2 days. In Vancouver alone there are approximately 10 FS operators. Considering the time and labour involved in creating individual voice discs this practice is not recommended at the time.

Apart from the issues raised during the interviews and discussed above additional consideration must be given to the following three questions in the development of a fully functional production model and complementary procedures:

1. At the present time auto-verify is not yet in use. What reliability is required to make the auto-verify mode a viable one?

2. Is it possible in the second software generation for the system to find logical errors in messages?

3. What kind of training packages (sample message edits, etc.) would be required for new users?

If the issues in this report are addressed then an auto PWIS should be readily accepted by pilots and truly reduce the workload on FS personnel.

5.0 CONCLUSION AND RECOMMENDATIONS

From a review of the generally favourable comments from both user groups it is evident that the prototype PWIS merits further development. In the case of the pilots the advantages of such a system include potentially easier and quicker access to aviation weather information. Furthermore, novice pilots would have more time to interrogate the system without feeling that they are keeping someone else from accessing the FS operator.

A fully functional system would eliminate the 15 minutes each hour that FS operators spend updating the existing system (providing aviation weather is one of their lower priority tasks). By eliminating the need for regularly updating the system their workload would be reduced and their attention could be focused on more important tasks during busy periods.

In conclusion:

1. TDC should consider funding the development of a fully functional prototype PWIS ready for production provided the needs of the pilots and FS personnel are adequately addressed.

2. AES should develop more stringent data entry standards.

3. ATS should announce the availability of the system more systematically and on a larger scale.

7.0 APPENDIX

Just Listened_____
Listen in Past_____
Never Listened_____

PATWAS QUESTIONNAIRE

Pilot Automatic Telephone Answering Service

Hello! This is_____ from Ergo Systems Canada Inc. We have been asked to conduct a formal evaluation of th PATWAS. When you called into FSS (or ACC) you volunteered to provide us with some comments on your experience with the system. Is this a convenient time to ask you a few questions ? It well take about 7 minutes.

Your comments and answers to the questions that I will be asking will be kept confidential. The responses from all the pilots we are surveying will be pooled. Please note that all this questionnaire is not related to the survey on weather services which you may have completed this past summer.

1. What type of aviation licence do you hold?

   Private _____ Commercial_____ Senior Commercial_____
   ATPL _____ Navigator_____

2. How long have you had your license? _____Years

3. How may hours have you flown in the last year? _____Hours

4. What type of flying do you usually do?
   IFR only _____ VFR only _____ IFR and VFR_____

5. What type of operation do you usually fly in? (Check all that apply)

Airlines_____	Commuter_____	Charter_____
Private_____	Military_____	Corporate_____

6. What is our normal area of operation?_____
   Within South-Western British Columbia?_____
   (This requires two answers. One is specific, and applies to those operations when done within S.W.B.C.)

7. How do you normally access pre-flight weather information? (read each option and check all that apply). Can you indicate the rough percentage that each (if more than one) is used?

   FSS - directly with operator?
   - By automated braodcast (PATWAS/TWB)

Weather office_____	Radio/television_____
Dispatcher_____	Personal Observation_____
Computer_____	Other (specify)_____

IF THE PILOT LISTENED TO THE PATWAS, GO TO QUESTION #10 (Omit 8 and 9).

8. At the time you indicated a willingness to participate in this project, you had not listened to the PATWAS. Why was a this (Read each option to the listener and check all that apply).

Did not know about it _____
Not applicable for the flight filed_____
Too cumbersome to use_____
Don't have a touch tone phone_____
Provides more information than I need_____
Does not allow me to ask question_____
Rate of speech is too slow_____
too fast_____
Others (specify)_____

9. What would you like to see changed to make it more useful to you?

_____

_____

Thank you for participating. Do you have any questions? Once again thank you very much for your time.

10. At the time you indicated a willingness to participate in the project, you had listened to the PATWAS. Have you used other systems like a DUAT user Access Terminal) such as TABS, WSI,Compuserve, or Kovouras to access pre-flight weather information at other times.

Yes _____ No_____

11. If yes to 10. how would you compare the system you have used _____ (specify) with PATWAS?

_____

_____(Open Comment)

12. Why did you use PATWAS for planning?

_____

_____(Open Comment)

13. How would you rate PATWAS on the following characteristics :

A. Rate of speaking (Circle one).

Too fast Fast Acceptable Slow Too slow

B. Efficiency of selecting the desired information (Check one).

Efficient_____ Acceptable_____ Cumbersome_____

14. In terms of priority, what features would you like to see incorporated? Rate priority in ters of **High, Moderate and Low.**

a) User selection sequence of information_____
b) Ability to return to category of message_____
c) Ability to return to message within category_____
(ie: A station within a terminal forecasts)_____
d) Ability to redial direct voice link with FSS without hanging up._____
e) Other (specify)_____

15. What other observations or comments would you like to make on the system?

_____
_____
_____
_____
_____
_____

Thank you for participating. Do you have any questions? Once again thank you very much for your time.

APPENDIX B

Transport Canada Aviation Weather
1988 Partial Study Results
For Southern BC/Alberta

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

3. Type of operation?

	Number	Percentage
Airline	21	3.78
Commuter	22	3.96
Charter	89	16.04
Private	471	84.86
Military	6	1.08
Corporate	40	7.21
Government	3	0.54

5. How do you normally access pre-flight weather information?

	TRUE	Percentage
FSS	415	74.77
Weather Office	407	73.33
Dispatcher	27	4.86
Computer	31	5.59
PATWAS/TWB	120	21.62
Radio/Television	218	39.28
Personal Observation	300	54.05

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

6. How would you rate the content of weather briefing service provided by:

- FSS specialists?

	Number	Percentage
poor	8	1.44
fair	110	19.82
good	300	54.05
very good	109	19.64
Non Response	28	5.05
TOTAL	555	

6. How would you rate the content of weather briefing service provided by:

- Atmospheric Environment Service (AES) briefers?

	Number	Percentage
poor	8	1.44
fair	83	14.95
good	250	45.05
very good	116	20.90
Non Response	98	17.66
TOTAL	555	

7. (a) How often do you have trouble getting access to weather briefings from:

- FSS specialists?

	Number	Percentage
never	163	29.37
infrequently	228	41.08
sometimes	115	20.72
often	25	4.50
Non Response	24	4.32
TOTAL	555	

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results Based on 3123 Responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

7. (a) How often do you have trouble getting access to weather briefings from:

- AES specialists?

	Number	Percentage
never	123	22.16
infrequently	180	32.43
sometimes	120	21.62
often	27	4.86
Non Response	105	18.92
TOTAL	555	

7. (b) Does this sometimes cause you to go flying without obtaining the weather information you feel you require for the flight?

	Number	Percentage
Yes	86	15.50
No	455	81.98
Non Response	14	2.52
TOTAL	555	

8. (a) How would you rate the overall accuracy of:

- terminal forecasts (FT)?

	Number	Percentage
poor	19	3.42
fair	181	32.61
good	310	55.86
very good	35	6.31
Non Response	10	1.80
TOTAL	555	

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

8. (a) How would you rate the overall accuracy of:

- area forecasts (FA)?

	Number	Percentage
poor	26	4.68
fair	230	41.44
good	252	45.41
very good	29	5.23
Non Response	18	3.24
TOTAL	555	

8. (b) Would you prefer to see area forecasts in a graphic format?

	Number	Percentage
Yes	353	63.60
No	131	23.60
Non Response	71	12.79
TOTAL	555	

9. What percentage of your flights are over 500 nautical miles?

	Number	Percentage
0 percent	181	32.61
less than 25 percent	334	60.18
25 - 50 percent	38	6.85
over 50 percent	2	0.36
Non Response	0	0.00
TOTAL	555	

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

10. (a) Have you ever used a DUAT (Direct User Access Terminal) such as TABS, WSI, Compuserve, or Karvouras to access pre-flight weather information?

	Number	Percentage
Yes	97	17.48
No	456	82.16
Non Response	2	0.36
TOTAL	555	

10. (b) If you answered yes to part (a), how do you compare DUATs briefings with personal contact briefings?

	Number	Percentage
worse	44	7.93
same	35	6.31
better	16	2.88
Non Response	460	82.88
TOTAL	555	

11. (a) If you could access weather and NOTAM and file a flight plan on a personal computer at a reasonable cost, would you use this option?

	Number	Percentage
never	111	20.00
infrequently	100	18.02
sometimes	120	21.62
often	216	38.92
Non Response	8	1.44
TOTAL	555	

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

11. (b) What would be the maximum amount you would be willing to pay per access to the service described in 11 (a)?

	Number	Percentage
No cost	228	41.08
$0 - 4	237	42.70
$5 - 9	29	5.23
$10 or more	8	1.44
Non Response	53	9.55
TOTAL	555	

12. How often would you make use of a 10 minute Canadian aviation weather program on TV presented once or twice a day (similar to AM Weather in the USA)?

	Number	Percentage
never	43	7.75
less than once per week	101	18.20
1 - 2 times per week	129	23.24
3 - 4 times per week	89	16.04
daily	182	32.79
Non Response	11	1.98
TOTAL	555	

13. How often would you use a computerized FATWAS (Pilot Automatic Telephone Weather Answering Service) which would enable you to separately select either FTs, FAs, SAs or FDs, (or any combination) for several local airports?

	Number	Percentage
never	43	7.75
infrequently	110	19.82
sometimes	217	39.10
often	176	31.71
Non Response	9	1.62
TOTAL	555	

AIR NAVIGATION SERVICES

SURVEY ON AVIATION WEATHER

Final Results based on 3123 responses
November 3, 1988

Survey Results for Area of Operation - Southern B.C./Alberta

Breakdown by Question

14. If services described in questions 11, 12 or 13 were available, would you make fewer calls or visits to the FSS or Weather Office?

	Number	Percentage
Yes	365	65.77
No	169	30.45
Non Response	21	3.78
TOTAL	555	

15. How would you rate the availability of weather information when you need it:

- on the ground?

	Number	Percentage
poor	11	1.98
fair	95	17.12
good	322	58.02
very good	123	22.16
Non Response	4	0.72
TOTAL	555	

- in the air?

	Number	Percentage
poor	18	3.24
fair	117	21.08
good	302	54.41
very good	93	16.76
Non Response	25	4.50
TOTAL	555	

Southern B.C./Alberta

Pre-Flight Access

Record#	q16 succes
1	I WOULD FIND ITEM 13 TO BE THE MOST USEFUL METHOD TO OBTAIN WEATHER INFO PROVIDING YOU DIDN'T GET A BUSY SIGNAL EVERY TIME YOU CALLED.
2	AT THE EDM. INT. AIRPORT. THE WEATHER OFFICE IS VERY DIFFICULT TO ACCESS. ALTHOUGH YOU CAN SOMETIMES GET EXCELLENT AND THOROUGH BRIEFING FROM AES BRIEFERS. THEY ARE FREQUENTLY FOR BUSY WITH OTHER DUTIES. ALSO THERE MUST BE A BETTER WAY OF WARNING PILOTS ABOUT SEVERE WEATHER. EG. 100KM WIND STORM HIT YEG ON MAY 23. 1988 AT 2 PM. A SEVERE WEATHER WARNING WAS ISSUED AFTER THE STORM HIT AND NEITHER FSS OR THE TOWER CONTROLLERS HAD ANY FOREWARNING FROM AES. AT THIS AIRPORT. WE MUST PHONE OR VISIT THEIR SEPARATE FACILITIES TO ACCESS WEATHER. NOTAMS AND FILE A FLIGHT PLAN. VERY TIME CONSUMING AND INCONVENIENT. HOWEVER NOTHING CAN REPLACE A WEATHER BRIEFING IN PERSON FROM A QUALIFIED BRIEFER. EXCELLENT TRAINING FOR STUDENT PILOTS.
3	STRONGLY SUPPORT THE INITIATIVE OF MAKING WEATHER ADVISORIES MORE ACCESSIBLE. BRIEFINGS AT WEATHER OFFICE ARE VERY GOOD. BUT OVER THE PHONE THE BRIEFERS CAN BE UNHELPFUL CERTAINLY IN COMPARISON TO FSS IN STATES. ANY CHANCE YOU COULD ENCOURAGE BRIEFERS TO BE A BIT MORE INTERESTED/HELPFUL ON THE PHONE. DON'T THINK YOU CAN JUST RING ON IDEA #13 ABOVE- ANY GOOD PILOT NEEDS A THOROUGH IDEA OF THE WEATHER PATTERN.
4	ALTHOUGH I ALWAYS CALL THE T.W.B. FIRST. I ALWAYS FEEL MORE CONFIDENT TALKING TO A HUMAN WHOM YOU CAN QUESTION.
5	I OBTAIN WEATHER FROM CALGARY AES VIA TWB AND SOMETIMES FSS. THE TWB IS SET UP FOR IFR: IT WOULD BE NICE TO HAVE A VFR TWB BUT. WHEN I NOTE TO AES THAT I'M VFR I GET A GOOD VFR TYPE BRIEFING. ALL THE CHAPS ARE GOOD.THE BIGGEST TROUBLE I HAVE IS A BUSY SIGNAL AT FSS WHEN I WANT TO FILE A FLIGHT PLAN AT CALGARY FSS. SOMETIMES I FILE VIA LONG DISTANCE TO MY DESTINATION TO AVOID THE DELAY IN GETTING THROUGH AND THAT DOES NOT DISTURB ME. I'M USUALLY A WEEKEND FLYER AND THE SYSTEM NEED NOT BE UPSIZED FOR MY CONVENIENCE.
6	IT'S HARD TO REPLACE AN ACTUAL WEATHER BRIEFING ON A PERSON TO PERSON SITUATION.
7	LIVE IN RURAL AREA. HAVE TO CALL LONG DISTANCE FOR WX. WOULD USE MORE OFTEN FOR LOCAL FLYING IF COULD CALL TOLL FREE.

Southern B.C./Alberta

Pre-Flight Access

Record#	ola suggel
8	COMPUTER ACCESSIBILITY IS THE WAY TO GO. WE BETTER START WORKING ON IT RIGHT AWAY.
9	I LIKE TALKING TO THE WEATHER PERSON. I CAN ASK FOR MORE DETAILS AND THEY CAN EXPLAIN. THEY HELP PAINT A BETTER PICTURE FOR THE PILOT.
10	AS A FLIGHT INSTRUCTOR I FIND MY STUDENTS OFTEN CANNOT GET A FULL WX BRIEFING OVER THE PHONE. BECAUSE THE BRIEFERS TALK TOO FAST AND DO NOT SEEM TO HAVE THE TIME OR PATIENCE TO DEAL WITH SOMEONE JUST LEARNING THE SYSTEM. THIS LEAVES A BAD IMPRESSION WITH THE STUDENT. PLEASE NOTE THIS IS JUST SOME BRIEFERS OVERALL THE FSS/WX OFFICE SYSTEM IS EXCELLENT.
11	AN 800 NUMBER WOULD BE A CHEAP ALTERNATIVE.
12	PERSONAL BRIEFINGS BY FSS OR WX OFFICE STILL RATE MY PREFERENCE. THERE HAVE BEEN A NUMBER OF COMPUTER DOWN TIME WHICH MAY RESULT IN DELAYED INFO OR PERHAPS IN ACCURATE BRIEFING.
13	DEPENDENT ON THE AREA ONE OPERATES IN. IN OUR CASE THERE IS A WEATHER OFFICE DIRECTLY ADJACENT TO US THERE WE USE IT CONTINUALLY. ALSO THE 1-800 TELEPHONE TO VANCOUVER FSS GIVES A COMPARISON AND IS IN OUR CASE EXCELLENT WX REPORTING AVAILABILITY.
14	AVIATION WX AVAILABLE ON CHTV IN THE YVR AREA IS QUITE USEFUL FOR HOME ACCESS BUT THE VIEWING TIME UNPREDICTABLE. THE VHF CONTINUOUS WX VOICE-OVER ON THE TRANSPORTATION WX (SAME CHANNEL 31) IS USEFUL. HOWEVER . THE ARTICULATION OF SOME OF THE BROADCASTERS IS SLOPPY AT BEST AND SOMETIMES DOWNRIGHT IRRITATING.

Record#	ola suggel
15	POOR COVERAGE IN SOUTHERN B.C. WEATHER IN FRASER CANYON AND WHISTER NOT INCLUDED OR AVAILABLE. MOST FLIGHT FROM PRINCE GEORGE TO VANCOUVER. OFTEN JUST HAVE TO GO TAKE A LOOK. THIS RENDERS SERVICE ALMOST USELESS.
16	THERE IS NO SUBSTITUTE FOR PERSON TO PERSON CONTACT. A RECORDING IS A GOOD START - BUT IN THE FINAL ANALYSIS IT IS THE PERSON TO PERSON CONTACT.

Southern B.C./Alberta

Pre-Flight Access

Record#	a16 suggei
17	QUALITY OF WX BRIEFING USUALLY DEPENDENT ON BRIEFER. SOME EXCELLENT SOME POOR. USUALLY TELEPHONE BRIEFINGS ARE NOT SATISFACTORY. PERSONAL VISIT TO WX OFFICE MORE HELPFUL.
18	MORE PHONE LINES TO WEATHER OFFICES. IN IFR CONDITIONS BOTH EDMONTON WEATHER OFFICES ARE CONTINUOUSLY ENGAGED.
19	I REALIZE THAT FATWAS IS MORE COST EFFECTIVE AND EFFICIENT. HOWEVER. I MUCH PREFER DIRECT CONTACT WITH A BRIEFER. ESPECIALLY IF WEATHER IS LESS THAN IDEAL.
20	AT MAJOR LOCATIONS A TELEPHONE QUEUING SYSTEM SHOULD BE INSTALLED TWB COULD BE ASSOCIATED. ALSO AT THESE LOCATIONS SOME OF YOUR ALTERNATIVES SHOULD BE ADDED TO WHAT IS AVAILABLE SO AIR CREW COULD SET THEIR OWN PRIORITIES WHEN DELAYS ARE INEVITABLE. HALF HOUR DELAYS OCCUR OFTEN AT MAJOR LOCATIONS DURING IFR WX AND ARE UNACCEPTABLE SINCE WX IS THE PRIME FLIGHT PLANNING CONSIDERATION. IF YOU ASKED THE RIGHT QUESTIONS YOU'D LIKELY FIND THAT MOST PILOTS WANT AN AES WALK IN OR TELEPHONE BRIEFING WITH FSS AS THE NEXT BEST ALTERNATIVE. THESE OTHER THINGS ARE SUPPOLEMENTARY. THEY'LL OCCASIONALLY FILL THE GAP BUT WON'T REPLACE THE REQUIREMENT FOR AES/FSS. YOUR QUESTIONS ARE LEADING AND WILL LIKELY GET YOU THE RESULTS YOU RE LOOKING FOR. IN A NUTSHELL MOST STATIONS WITH AES AND/OR FSS WEATHER ARE GREAT.
21	THE LARGEST PROBLEM IN ACCESSING WX SERVICES IN VANCOUVER IS GETTING THROUGH TO THE WX OFFICE ON THE PHONE. IF THERE WAS ANOTHER MEANS OF ATTAINING THE INFORMATION THE SERVICES AVAILABLE WOULD BE MORE THAN ADEQUATE.
22	REGARDLESS OF HOW WELL METEOROLOGICAL INFO IS PROVIDED BY ELECTRONIC MEDIA. A PILOT ALWAYS WANTS THE PRO'S INTERPRETATION OF THE SITUATION CURRENTLY AT DESTINATION AS WELL AS HIS VIEWS ON THE LIKELIHOOD OF CHANGE. A PILOT WHO'S CONCERNED ABOUT EN ROUTE WEATHER HAS A MULTITUDE OF QUESTIONS. THE FSS PERSONNEL AND MET (AES BRIEFERS) NEED TO BE AVAILABLE TO PROVIDE THIS ESSENTIAL SERVICE.
23	FATWAS WOULD BE EXCELLENT IN SITUATIONS WHEN WAITING FOR WEATHER TO CLEAR. AVOIDS CONTINUOUS PHONE CALLS TO FSS. SHOULD INCLUDE ALL REGIONAL AIRPORTS. SELECTED BY CODE FROM TONE DIAL PHONES.

Southern B.C./Alberta

Pre-flight Access

Record#	q16 succe1
24	TELEPHONE TO AES IS ALWAYS TIED UP.
25	WEATHER INFO IS GREAT WHEN YOU CAN GET A HOLD OF THE WEATHER OFFICE OR FSS. PHONES ARE OFTEN BUSY.
26	THE IDEA OF COMPUTER ACCESSED INFORMATION AND A PUBLIC BROADCAST SERVICE ON TV. WOULD BE GREAT. BUT ON THE DAYS OF MARGINAL WEATHER I STILL THINK THE PERSONAL ADVICE OF AN EXPERIENCED METEOROLOGIST IS NUMBER ONE.
27	IT SEEMS AS THOUGH WEATHER OFFICES ALWAYS HAVE THE PHONE OFF THE HOOK ON THE HOUR AS THE LATEST WEATHER ARRIVES. AS A FLYING INSTRUCTOR. MOST OF MY FLIGHTS DEPART ON THE HOUR AND IT IS SOMETIMES NECESSARY TO WAIT.
28	FREQUENTLY ONE HAS TO WAIT 1/2 HOUR OR SO PATIENTLY DIALING FSS OR AES TO GET A WEATHER BRIEFING BECAUSE THE PHONES ARE ALWAYS BURY. (VAN. AREA).
29	MAKE MORE ATIS RECORDINGS ACCESSIBLE BY PHONE. AN 800 NUMBER. TOUCH TONE SELECTABLE FOR VARIOUS AIRPORTS. THIS IS AVAILABLE AT ZBB VERY USEFUL. WOULD BE SPECIALLY GOOD FOR AIRPORTS WITH NO HOURLY WEATHER REPT.
30	WOULD LIKE TO SEE ATIS RECORDINGS ACCESSIBLE BY PHONE FOR MORE AIRPORTS SUCH AS AT CZBS. GIVES INFO WHICH IS VERY CURRENT FOR PLACES WITH NO WX REPORTING THROUGH AES/FSS.

Record#	q16 succe1
31	WEATHER INFO IS GOOD BUT NOT AS AVAILABLE AS IT SHOULD BE. IT WOULD BE USED MORE IF IT WERE EASIER TO OBTAIN.
32	BECAUSE THE NEAREST FSS IS 30 MILES AWAY AND ALL CALLS TO FSS OR AES ARE LONG DISTANCE. THE POLICY OF ACCEPTING COLLECT CALLS FOR WX AND FLIGHT PLANNING IS VERY USEFUL.

Southern B.C./Alberta

Pre-Flight Access

Record#	o16 suggel
33	IMPROVE ACCESS TO AV. WEATHER. I HAVE SPENT UP TO 1/2 HOUR TRYING TO PHONE IN ESPECIALLY IN THE EARLY AM. WEATHER BRIEFERS TEND TO BE TOO CONSERVATIVE. ON THREE OCCASIONS IN THE PAST MONTH THEY HAVE INDICATED BELOW VFR AND WHEN I DROVE THE ROUTE I NOTED IT WAS GOOD VFR ALL ALONG THE INTENDED ROUTE.
34	EDM. INT. A/P WX OFFICE VERY HARD TO REACH VIA TEL. WE UNDERSTAND NOT THE REQUIRED AMOUNT OF BRIEFERS ON DUTY EARLY MORNINGS TO HANDLE CALLS.
35	IN EDMONTON A ROTATING NUMBER THAT WOULD PERMIT QUEUING OF PHONE CALLS TO WEATHER AND NOTAMS WOULD. I THINK. BE AN IMPROVEMENT.
36	I OFTEN CALL SEATTLE FSS FOR THEIR RECORDED WX BRIEFING AND ROUTE INFO. IT IS DETAILED AND ACCURATE. WORTH THE COST OF A LONG DISTANCE CALL.
37	LEAVE CALGARY FSS AT INTERNATIONAL AIRPORT. MORE WEATHERMEN TO ANSWER PHONES AT PEAK PERIODS IN CALGARY 6-8 A.M. YOU USUALLY CAN'T GET THROUGH.
38	FSS IN MAJOR CENTRES IS EXTREMELY DIFFICULT TO CONTACT DURING BUSY HOURS. THE INFORMATION IS GOOD WHEN YOU CAN GET HOLD OF THEM. THEY ARE CLEARLY TOO OVERLOADED TO GIVE A DETAILED REPORT.
39	I FEEL THAT CHARGING FOR ACCESS TO FSS INFORMATION WOULD DISCOURAGE PEOPLE FURTHER FROM FILING. OBTAINING WEATHER ETC.

Record#	o16 suggel
40	PILOTS MUST HAVE A GOOD KNOWLEDGE OF WEATHER TO UTILIZE ITEMS 11 12 13. BRIEFERS SHOULD ASK PILOTS QUESTIONS AT THE START OF THE BRIEFING TO DETERMINE HOW MUCH DETAIL THE PARTICULAR PILOT REQUIRES.
41	FACE TO FACE BRIEFINGS FROM FSS BRIEFERS ARE INVALUABLE AND THE BEST FORM OF AVIATION BRIEFINGS.
42	THE WX SERV. WE RECEIVE IN CALGARY IS GOOD BUT THE BRIEFERS OFTEN ASSUME WE DON'T NEED CERTAIN INFO. I BELIEVE ANY INFO IS GOOD INFO. I LIKE TO GET THE BIG PICTURE WITHOUT BEGGING FOR IT.

Southern B.C./Alberta

Pre-Flight Access

Record#	ala succel
43	I FIND AVIATION WEATHER INFORMATION EASILY OBTAINED AND REASONABLY ACCURATE IN ALL OF B.C. AND ALTA. ALTHOUGH SOME BRIEFERS LIKE TO REMIND YOU THAT THEY ARE DOING YOU A GIGANTIC FAVOUR. MOST ARE VERY HELPFUL AND COURTEOUS.
44	I LIVE 50 MI. FROM THE NEAREST FSS WX OFFICE. OBTAINING WEATHER BRIEFING USUALLY TAKES 6 TO 10 TRIES AND 30 MIN. TO 1 HOUR BECAUSE OF BUSY PHONES AT WEATHER OFFICE. I CAN USUALLY GET FSS ON SECOND OR THIRD TRY. AS A RESULT MY WEATHER BRIEFING USUALLY ENDS UP AS A CALL TO THE TWB AT EDMONTON COUPLED WITH PERSONAL OBSERVATIONS AND THE WEATHER REPORT FROM RADIO OR TV. MY FLIGHTS SELDOM TAKE ME TO AIRPORTS WHERE THERE ARE FSS OR WEATHER OFFICES.
45	A COMFUTER TECHNICIAN IN THE TOWER AT PITT MEADOWS WOULD SIGNIFICANTLY REDUCE TELEPHONE INQUIRES TO VANCOUVER FSS.
46	MY SON ALSO A PRIVATE PILOT. ENTHUSIASTICALY ENDORSES PATWAS. I PREFER A REAL LIVE PERSON.
47	ALTHOUGH I WOULD USE PATWAS DUAT OR TV WX SHOWS TO HELP ME ASSESS WX PRIOR TO FLIGHT AND THIS WOULD PROBABLY REDUCE MY USE OF FSS. I WOULD HOPE THE AVAILABILITY OF THESE SERVICES WOULD NOT REDUCE THE AVAILABILITY OF FSS OR WX OFFICES. I FEEL THE PERSONAL CONTACT BRIEFING IS VERY IMPORTANT TO THOSE OF US USING THE SYSTEM. I FEEL IT IS THE MOST IMPORTANT PART OF THE SYSTEM. THE OTHER SERVICES WOULD BE CONVENIENT ADDITIONS TO THE PRIMARY SERVICE PROVIDED BY FSS AND WX BRIEFERS.

Southern B.C./Alberta

Pre-Flight Access

Record#	o16 su0de2
1	IN MY AREA ALTA AND SOUTH B.C.. SOUTHERN B.C. DOES NOT HAVE ADEQUATE NOS. OF GROUND REPORTING POINTS. GOLDEN B.C. IS INFREQUENT OR AT LEAST NOT PREDICTABLE. ROGERS PASS SUMMIT IS AN OBVIOUS OMISSION.
2	WHEN TWB AT CALGARY IS OFF IT CAN BE VERY DIFFICULT GETTING THROUGH TO AES.
3	FLIGHT PLANNING. MY C182 IS BASED AT CYYC. BOTH FSS AND WEATHER OFFICE GIVE EXCELLENT SERVICE. BUT WHEN AWAY FROM MAJOR CENTERS. FIND THAT FSS PHONE OFTEN BUSY.
4	FLIGHT SERVICE AND WEATHER SPECIALISTS SEEM TO HAVE THE ATTITUDE THAT PILOTS WHO WANT A BRIEFING BE IT FOR A SHORT FLIGHT IN PERFECT WEATHER. OR A WELL DETAILED BRIEFING AREA INTERFERENCE IN THEIR WORK. I HAVE ON MANY OCCASIONS LEST THE WEATHER OFFICE IN FRUSTRATION WITH THE BRIEFERS ATTITUDE TOWARDS ME WANTING MORE WEATHER INFORMATION. EXPERIENCE WITH THE U.S. AUTOMATIC TELEPHONE WEATHER BRIEFING HAS BEEN VERY INADEQUATE. IN MY OPINION THIS SYSTEM IS A VERY BACKWARD STEP IN FLIGHT SAFETY.

Record# o16 suggel

8 I FEEL THE SERVICES DESCRIBED IN 11.12.13 WOULD BE OF GREAT VALUE TO THE AVIATION INDUSTRY. WITH THOSE SERVICES I WOULD PROBABLY DO A LOT MORE FLYING BECAUSE THE INFORMATION WOULD BE AT MY FINGERTIPS AND IT WOULD APPEAR BEFORE MY EYES RATHER THAN LISTENING TO A LENGHTY BRIEFING OVER THE PHONE AND TRYING TO WRITE IT DOWN. I'M 100% IN FAVOUR OF THE PROPOSED CHANGES.

9 RESPONSE TO QUESTION NO 14: IT WOULD DEPEND ON HOW THE SERVICES COMPARED TO FSS ETC. BUT I WOULD NOT NECESSARILY MAKE NO USE OF FSS ETC.

10 COMPUTERIZING THE WEATHER INFORMATION SOUNDS A LOT BETTER THAN SIFTING THROUGH TELEX PRINTOUTS COULD BE QUITE A TIME SAVER FOR FLIGHT PLANNING TOO.

11 I'M GLAD YOU MENTIONED THE USE OF PERSONAL COMPUTERS IN THIS SURVEY. THIS IS A SERVICE THAT IF IMPLEMENTED WOULD BE INVALUABLE TO PILOTS. PLEASE INCLUDE AREA AND NATIONAL MAP GRAPHIC CAPABILITY IF IMPLEMENTED.

12 A GRAPHIC FORMAT ON COMPUTER WOULD BE MORE EASILY REMEMBERED THAN A VERBAL WEATHER BRIEFING.

13 IN MY OPINION DUATS SHOULD NOT REPLACE THE TRAINED WEATHER BRIEFER. THEY SHOULD SUPPLEMENT THE BRIEFING SERVICE UNCOMPLICATED WEATHER SITUATIONS. ALLOWING BRIEFERS TO EXPAND UPON THE DUAT INFO AND DEAL WITH MORE CHALLENGING WEATHER PATTERNS.

14 I HAVE USED THE FATWAS SYSTEM AVAILABLE IN ATLANTA. GA AND FOUND IT TO BE A VERY ACCURATE AND CONVENIANT WAY TO ACCESS INFO. I STILL FIND HOWEVER THAT A GOOD FSS SPECIALIST CAN SOMETIMES GIVE YOU A MORE COMPLETE WEATHER PICTURE BY USING HIS KNOWLEDGE AND EXPERIENCE IN WEATHER TRENDS. HE MAY TELL YOU SOMETHING WHICH CAN HELP GREATLY THAT A COMPUTER CAN'T GIVE BECAUSE THE COMPUTER WON'T INTERPRET CHANGING WEATHER PATTERNS. IT ONLY TELLS YOU WHAT IS EXACTLY HAPPENING AT A GIVEN TIME.

Record# o16 suggel

15 PERSONAL COMPUTERS WOULD BE A GREAT IDEA FOR FLIGHT PLANS AND WEATHER.

16 NEED SERVICVE AS DESCRIBED 11.12.13.

DUATS/PC

Record#	a16_suggel
17	THE USE OF A PERSONAL COMPUTER TO ACCESS WEATHER. NOTAMS AND FILE A FLIGHT PLAN WOULD BE AN EXCELLENT IDEA FOR THE PILOT AS WELL AS THE AVIATION INDUSTRY. I WOULD VERY MUCH LIKE TO SEE SUCH AN IDEA COME INTO EFFECT.
18	I WOULD LIKE TO BE ABLE TO ACCESS ALL WEATHER INFORMATION AND NOTAMS. AS WELL AS FILING FLIGHT PLANS VIA MODEMS WITH PERSONAL COMPUTERS. I WOULD LIKE THE WX INFORMATION TO INCLUDE CURRENT WEATHER MAPS (GRAPHICS) AS WELL AS WRITTEN INFORMATION.
19	DUATS ARE GOOD FOR GENERAL PLANNING BUT IF WX IS TOUGH IT'S NICE TO TALK PERSONALLY TO A BRIEFER AND DISCUSS IT IN MORE DETAIL.
20	TV. WEATHER REPORTS WOULD BE MOST USEFUL. I WOULDN'T ALWAYS HAVE ACCESS TO P.C. AND A MODEM. COST OF P.C. SYSTEM WOULD HAVE TO BE SIMILAR TO A PHONE CALL. OTHERWISE I'D JUST CALL THE WEATHER OFFICE.
21	I FEEL THAT WEATHER SERVICES THAT WOULD BE AVAILABLE FOR ACCESS BY MY PERSONAL COMPUTER WOULD BENEFIT ME AS A PILOT AND AN AIR TRAFFIC CONTROLLER.
22	EASIER ACCESS TO NOTAMS IE. COMPUTER ACCESS AND PRINTOUTS OF SELECTED AIRPORTS AND AREAS IN REAL TIME. IE CYXD.
23	WEATHER INFORMATION FOR B.C. NEEDS TO BE CURRENT AS IT CHANGES RAPIDLY. A FEE FOR THE INFORMATION WOULD DISCOURAGE IT 'S USE WHICH WOULD NOT PROMOTE SAFETY.

Record#	a16 suggel
24	TABS SHOULD BE LOCATED AT THE PILOT BRIEFING AREA AT ALL IFR AIRPORTS AND AT ALL FLYING SCHOOLS. IT IS AN EXCELLENT SYSTEM.
25	SPECIAL INTEREST IN THE DUAT FOR PREFLIGHT WEATHER INFORMATION AND FLIGHT PLAN INFORMATION.

DUATS/PC

Record# g16 suggei

16 IF THERE WAS A CHARGE FOR SMALL COMMERCIAL OR PRIVATE PILOTS IT WOULD DISCOURAGE THEM FROM OBTAINING WX BRIEFINGS. THEREBY COSTING THE GOVERNMENT IN SEARCH AND RESEARCH LOOKING FOR A/C LOST IN REDUCED WX.

27 RE. QUESTION 11A TO 13. OFTEN FOR ME MEANS EVERYTIME I WOULD FLY CROSS-COUNTRY AND THUS FILE A FLIGHT PLAN. BUT I ONLY FLYCROSS-COUNTRY 3-4 TIMES PER YEAR. I WOULD ACCESS THE WEATHER DATA FOR EVERY LOCAL FLIGHT TOO. THOUGH.

28 DUATS ARE VERY USEFUL. BUT MY EXPERIENCE WITH RELIABILITY HAS NOT BEEN GOOD. OFTEN HAVE HAD PROBLEMS GETTING INTO OR BEING DISCONNECTED FROM TABS. I WOULD PREFER TO SEE A FIXED ANNUAL COST OF ABOUT $30 TO $50 FOR SUCH A SERVICE. ALSO I WOULD CONSIDER IT IMPORTANT TO BE ABLE TO FILE A VFR FLIGHT PLAN THROUGH SUCH A SERVICE.

29 THIS QUESTIONNAIRE WAS OBVIOUSLY DESIGNED TO JUSTIFY A COMPUTER PROJECT. PC ACCESS FOR FREE SHOULD BE AVAILABLE FOR ALL PILOTS IN THE TERMINAL MAKE AT 1200 BAND. IF A PASSWORD IS NECESSARY IT SHOULD BE THE PILOT LICENSE NUMBER AND SHOULD NOT HAVE TO BE CHANGED UNLESS THE PILOT WANTED TO CHANGE IT. SHOULD BE TOLL FREE. THE 24 HOUR ASPECT WOULD BE GREAT BECAUSE OF PILOTS UNUSUAL HOURS. PERSONAL BRIEFERS SHOULD NOT BE REPLACED. THIS SHOULD BE ADDITIONAL.

30 SOME OF THE DUAT SERVICES ARE TOO COMPLEX FOR EASY ACCESSABILITY OF THE INFORMATION NEEDED.

31 I WOULD NOT LIKE TO SEE A TRANSCRIBED OR COMPUTERIZED SERVICE REPLACE EITHER FSS OR WEATHER OFFICE. THE PERSONAL EXPERIENCE AND INTERPRETATION OF THOSE PROFESSIONALS IS INVALUABLE DURING PERIODS OF QUESTIONABLE VFR CONDITIONS.

32 I WOULD LIKE TO SEE ON PC/MODEM ACCESS TO AVIATION WX AND FLIGHT PLANNING BECOME AVAILABLE.

DUATS/PC

Record# u16 subdel

33 THE CONCEPT OF USING PERSONAL COMPUTERS IS A FANTASTIC IDEA. IT OFFERS SEVERAL ADVANTAGES: 1.GREATER CONVENIENCE. 2. THE MONITORS OF THE PERSONAL COMPUTERS WOULD BE A GREAT MEDIUM BY WHICH TO DEPICT FA'S IN GRAPHIC FORMAT. 3. THE PRINTERS OF THE PERSONAL COMPUTERS COULD EASILY PRINT A HARDCOPY OF THE FA'S. WINDS ALOFT. ETC. 4. IT WOULD SEEM SIMPLE TO ADD A SMALL MULTIFUNCTION COMPUTER WHICH COULD ALSO TAKE IN THIS INFORMATION. STORE AND UPDATE THE INFORMATION. AND ALSO DISSEMINATE IT. VIA THE PHONE LINES. WHEN ACCESSED BY HOME OR OFFICE PERSONAL COMPUTERS(IE. A NETWORK). THUS LITTLE INTERACTION WITH THE WEATHER BRIEFER WOULD BE NECESSARY...THE COST OF ACCESSING THE SYSTEM AT THE VERY MOST. I CAN SEE CHARGING A TOKEN USER FEE. THE HIGH COST OF A PERSONAL COMPUTER. PC. COMBINED WITH A LARGE USER FEE WOULD RESULT IN VERY FEW PILOTS USING THE SYSTEM. TOO MUCH CAN NOT BE CHARGED AS CURRENT METHOD OF OBTAINING WEATHER INFO.IS FREE. BY CHARGING VERY LITTLE FOR USAGE MOST PILOTS WOULD AT LEAST TRY THE SYSTEM. A SMALL COMMERCIAL OPERATOR COULD HAVE A WEATHER OFFICE AND A FSS IN HIS OWN OFFICE JUST BY PURCHASING A PC AND A MODEM.

34 A GOOD COMPUTER ACCESS SYSTEM WOULD BE A GREAT IDEA. NOTE THAT THE SYSTEM SHOULD BE PROVIDED FREE OF COST TO ALL USERS JUST LIKE ACCESS TO FSS.

35 WOULD USE TV WEATHER DAILY. COMPUTER WEATHER ACCESS AND PLAN FILING WOULD BE USED WHEN NOT AT MAJOR CENTRE. WOULD USE TV AND/OR COMPUTER DAILY FOR INITIAL GO NOGO DECISION. THEN WOULD USE PERSONAL CONTACT BRIEFING FOR ACTUAL.

36 MY BIGGEST PROBLEM IS GETTING WX TRENDS 2-3 DAYS AHEAD. YOU CAN GET THEM AT WX OFFICE BUT NOT OVER THE PHONE. A GOOD TV PRESENTATION IS EASIER OFTEN.. I'M GENERALLY LOOKING TO SEE IF WX SHOULD BE OK MARGINAL OR IMPASSABLE ON A RETURN FLIGHT. NO GUARANTEES EXPECTED. IF WX BAD OR MARGINAL I CAN THEN GO BY CAR. OR CHANCE A DELAY.

37 THE POSSIBILITY OF COMPUTER LINKUPS IS EXCITING AS LONG AS IT COMPLIMENTS AND SUPPORTS THE BASIC FSS SERVICE. I WOULD NOT LIKE TO SEE FSS REPLACED BY COMPUTERS OR PHONE SERVICES.

Record# a16 sugge1

38 WEATHER NOTAMS AND FLIGHT PLANS WOULD BE FANTASTIC THROUGH AT PERSONAL COMPUTER. ELIMINATE A CALL/VISIT TO WEATHER OFFICE AND RECEIVE BRIEFING VIA HARDCOPY THROUGH A PERSONAL COMPUTER PRINTER...LESS CHANCE OF ERRORS.

39 I WOULD MUCH APPRECIATE A PERSONAL COMPUTER ACCESSABLE SYSTEM (BY MODEM AND TELEPHONE) SIMILAR TO DUAT IDEA TO FILE FLIGHT PLANS. ACCESS NOTAMS. ETC. AND WEATHER INFO. SO PILOTS AND OTHER USERS COULD ACCESS THIS FROM THEIR HOMES. IT COULD SAVE MUCH TIME AND POSSIBLY SAVE MUCH MONEY BY ALL ESPECIALLY BY REDUCING CONGESTION AT FSS'S AND WEATHER OFFICES.

40 I WOULD STRONGLY SUPPORT ANY EFFORTS TO INCREASE AVAILABILITY OF DUATS. PATWAS. AND FLIGHT PLANNING INFO. AVAILABLE ON PERSONAL COMPUTERS. I BELIEVE SUCH RESOURCES WOULD ENCOURAGE MORE COMPLETE PREFLIGHT PLANNING FOR THOSE PILOTS NOT LOCATED NEAR FSS/AES OFFICES.

41 THE MONEY SAVED IN CUTTING BACK PERSONNEL IN THE WEATHER OFFICE WOULD MORE THAN COVER A COMPREHENSIVE COMPUTER ACCESS SYSTEM THEREFORE PILOTS SHOULD HAVE TO PAY NO COSTS.

42 YOU ARE ON TRACK WITH COMPUTER FACILITIES. ESPECIALLY IN THE HOME ENVIRONMENT. FSS COULD SPONSOR SEMINAR LIKE OPERATIONS UPDATE WHICH WAS VERY ENCOURAGING TO NEWCOMERS LIKE MYSELF.

43 THE CURRENT SYSTEM WORKS WELL AND IS EASY TO USE. I ENJOY HAVING A BRIEFER EXPLAIN THE WEATHER SITUATION SINCE HE HAS BEEN WATCHING IT CONTINUOUSLY. A DUAT WOULD BE MOST USEFUL TO ME ACCESSED FROM A HOME/OFFICE COMPUTER FOR GENERAL WEATHER TREND ANALYSIS.

44 I WOULD USE DUAT AND PATWAS FIRST AND THEN IF I NEEDED INTERPRETATION OR IN SIGHT I WOULD SEE THE WX BRIEFER.

Record# a16 sugge1

43 PRESENTLY THERE IS NO COST INVOLVED IN FILING FLIGHT PLANS. I FEAR THAT IF COMPUTER ACCESS TO FILE A FLIGHT PLAN AND OBTAIN WX AND NOTAMS INVOLVED A FEE. MOST PILOTS WOULD NOT USE THE SERVICE. I SUGGEST PROVIDING THE SERVICE FREE FOR AT LEAST 1 TO 2 YEARS AND THEN GRADUALLY ADDING A COST. SO MUCH IS ALREADY INVESTED IN FEDERAL SUPPORT OF GENERAL AVIATION THAT THE COSTS FOR COMPUTER ACCESS FOR FLIGHT PLANS AND WX COULD BE ABSORBED BY MOT FOR A FEW YEARS AT LEAST.

46 IF A PERSON FLIES A LOT EXCESS COSTS COULD SOON ADD UP.

Record# o16 suooe1

47 I AM IN MY FIRST YEAR OF FLYING. I WOULD LIKE TO SEE COMPUTER ACCESS BY PHONE SINCE YOU THEN HAVE THE ACCURATE LIST OF FA. FT. SA. ETC. UPON WHICH TO BASE YOUR FLIGHT PLANS.

48 THE COMPUTER ACCESS IS A GOOD IDEA. AS LOGN AS THE INFORMATION IS UP TO DATE. REVISED SA AND FT SHOULD BE QUICKLY DISTRIBUTED AND PUBLISHED AS SOON AS THEY OCCUR. EVEN IF IT IS BETTER WEATHER. THE REASON IS THAT PILOTS WHO ARE INFORMED OF LOW WEATHER AND DECIDE THAT IT IS NOT TOO BAD (LOW). ONLY TO FIND THAT THE CEILING IS 10.000 FEET ABOVE THE FORECAST. OR LAST REPORTED SA. OR EVEN CLEAR SKY. GET THE IDEA THAT MAYBE WEATHER SLIGHTLY LOWER THAN THEY WOULD ATTEMPT TO FLY IN MAY NOT BE AS BAD AS STATED OR REPORTED DUE TO PREVIOUS EXPERIENCE.

Record# o16 suooe2

1 SOME SYSTEM SHOULD BE AVAILABLE TO PUT TO TOGETHER LOGICAL ROUTE PLANS SIMILAR TO TABS AT EACH WEATHER OFFICE.

2 I STRONGLY SUPPORT A COMPUTER ACCESSIBLE SYSTEM. PREFERABLY WITH GRAPHIC OUTPUT AND A DAILY TV REPORT. THE AVIATION WEATHER OFFICE ALWAYS DOES AN EXCELLENT AND METHODICAL JOB BUT THEY TOO ARE CLEARLY GETTING OVERLOADED.

3 GENERAL AVIATION COSTS ARE SKYROCKETING AND IF I'M PREPARED TO MAKE COST ARRANGEMENTS FOR A COMPUTER I SHOULD NOT HAVE TO PAY FOR A COMPUTERIZED TELE-CALL FOR A SERVICE ALREADY IN PLACE.

4 FOR ME THE ULTIMATE SOLUTION WOULD BE SOMETHING WHICH WOULD ALLOW ME TO MAKE ONE PHONE CALL WITH MY COMPUTER AND GET WEATHER / NOTAM AND FILE FLIGHT PLAN. THIS WOULD ALSO GIVE THE ADVANTAGE OF HAVING A PRINTOUT OF THE WEATHER TO TAKE ALONG FOR REFERENCE AND UPDATING AS THE FLIGHT PROGRESSED BY ENTERING MY FLIGHT PLAN ON THE COMPUTER. IT WOULD SAVE TIME AND PRODUCE GREATER ACCURACY IN SPELLING DETAILS. ETC. COUPLE THIS WITH A GOOD AVIATION WEATHER BROADCAST ON TV TWICE DAILY MORNING AND EVENING WHICH I COULD VIDEO TAPE FOR REVIEW AND WHICH WOULD GIVE ME A PICTORIAL REPRESENTATION OF THE WEATHER PATTERNS. THIS WOULD SEND ME ON MY FLIGHT BETTER PREPARED THAN I HAVE BEEN ON THE MAJORITY OF MY FLIGHTS TO DATE. OF COURSE. I'M ASSUMING THAT THIS SYSTEM COULD HANDLE MORE THAN ONE PHONE CALL AT A TIME. IT WOULD BE WORTH PAYING A FEE FOR EACH TIME I USE IT.

Southern B.C./Alberta

DUATS/PC

Record# a16 sudde3

1 FOR THIS REASON HAVE ALREADY FURCHASED A TABS.

2 I LIKE TABS WHEN PLANNING A LONG TRIF BECAUSE I CAN SIT AND READ AND DIGEST THE WHOLE THING. AS WELL FA'S ARE AVAILABLE FOR A MUCH LONGER AREA THAN PROVIDED ON TWB. THE COMPUTER SYSTEM WOULD HAVE TO BE VERY USER BRIENDLY AND QUICK TO USE SINCE BILLING WOULD BE ON A TIME BASIS FRESUMABLY.